AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (CANCELED)

2. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 3 wherein said step of enabling an integrator comprises sending an open secondary detection enable flag signal.

3. (PREVIOUSLY PRESENTED) A method of detecting an open secondary winding, comprising the steps of:

enabling an integrator;

resetting said integrator;

detecting an ionization voltage;

integrating said ionization voltage over a spark window;

comparing said integrated ionization voltage with a threshold;

setting an open secondary flag if said integrated ionization voltage is below said threshold; and

using a rising edge of an ignition charge pulse to reset said integrator.

4. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 3 wherein a size of said spark window is between 300 microseconds and 3 milliseconds.

5. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 3 wherein a powertrain control module sets said open secondary flag.

6. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 3 further comprising a step of calculating said threshold by:

multiplying a maximum ionization voltage by a spark window time, whereby an integrated value is calculated, and

multiplying said integrated value by a percentage.

7. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 3 wherein said step of detecting an open secondary occurs during an ignition phase of an ionization signal.

8. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 2 further comprising the steps of:

calculating said threshold by

multiplying a maximum ionization voltage by a spark window time, whereby an integrated value is calculated, and

multiplying said integrated value by a percentage; and

wherein a size of said spark window is between 300 microseconds and 3 milliseconds, said maximum voltage is 5 volts, and a powertrain control module sets said open secondary flag.

9. (ORIGINAL) The method of detecting an open secondary winding according to claim 6 wherein said percentage is 75%.

10. (CANCELED)

11. (PREVIOUSLY PRESENTED) A method of detecting an open secondary winding, comprising the step of measuring spark duration, wherein said step of measuring spark duration comprises:

comparing an ionization signal with a first threshold;

measuring the spark duration when said ionization signal is greater than said first threshold;

comparing said spark duration with a second threshold; and

setting an open secondary flag.

12. (PREVIOUSLY PRESENTED) The method of detecting an open secondary winding according to claim 11 wherein said step of measuring spark duration comprises:

detecting said ionization signal over a spark window;

enabling a timer if said detected ionization signal is greater than said first threshold;

disabling said timer after said detected ionization signal falls below said first threshold;

comparing a timer output with said second threshold; and

setting said open secondary flag if said timer output is below said second threshold.

13. (ORIGINAL) An open secondary winding detection apparatus, comprising:

a first comparator having a first and a second input and an output, wherein said first input is operably connected to an ionization signal and said second input is operably connected to a first threshold;

a controller having a first and an enable input and an output, wherein said first input is operably connected to said output of said first comparator;

a timer having a first and an enable input, and an output, wherein said first input is operably connected to said output of said controller; and

a second comparator having a first and a second input and an output, wherein said first input is operably connected to said output of said timer and said second input is operably connected to a second threshold.

14. (ORIGINAL) The open secondary winding detection apparatus according to claim 13 further comprising a powertrain control module having an output operably connected to said enable input of said controller.

15. (CANCELED)

16. (PREVIOUSLY PRESENTED) The open secondary winding detection apparatus according to claim 18 further comprising an open secondary detection enable flag signal operably connected to said enable input of said integrator.

17. (PREVIOUSLY PRESENTED) The open secondary winding detection apparatus according to claim 18 further comprising a powertrain control module having an input operably connected to said output of said comparator and an output operably connected to said enable input of said integrator.

18. (PREVIOUSLY PRESENTED) An open secondary winding detection apparatus, comprising:

an integrator having an ionization signal input, an enable input, a reset input and an output; and

a comparator having a first input operably connected to said output of said integrator, a second input operably connected to a threshold value, and an output,

wherein said reset input of said integrator is operably connected to an ignition charge pulse.

19. (PREVIOUSLY PRESENTED) The open secondary winding detection apparatus according to claim 18 wherein said ionization signal input of said integrator is operably connected to an ionization current measuring circuit.

20. (CURRENTLY AMENDED) The open secondary winding detection apparatus according to claim 17, ~~18 further comprising:~~

~~a powertrain control module having an input operably connected to said output of said comparator and an output operably connected to said enable input of said integrator, whereby~~

wherein an open secondary detection enable flag signal is sent by said powertrain control module to

said enable input of said integrator; and wherein said ionization current input of said integrator is operably connected to an ionization current measuring circuit.